

Fig. 1

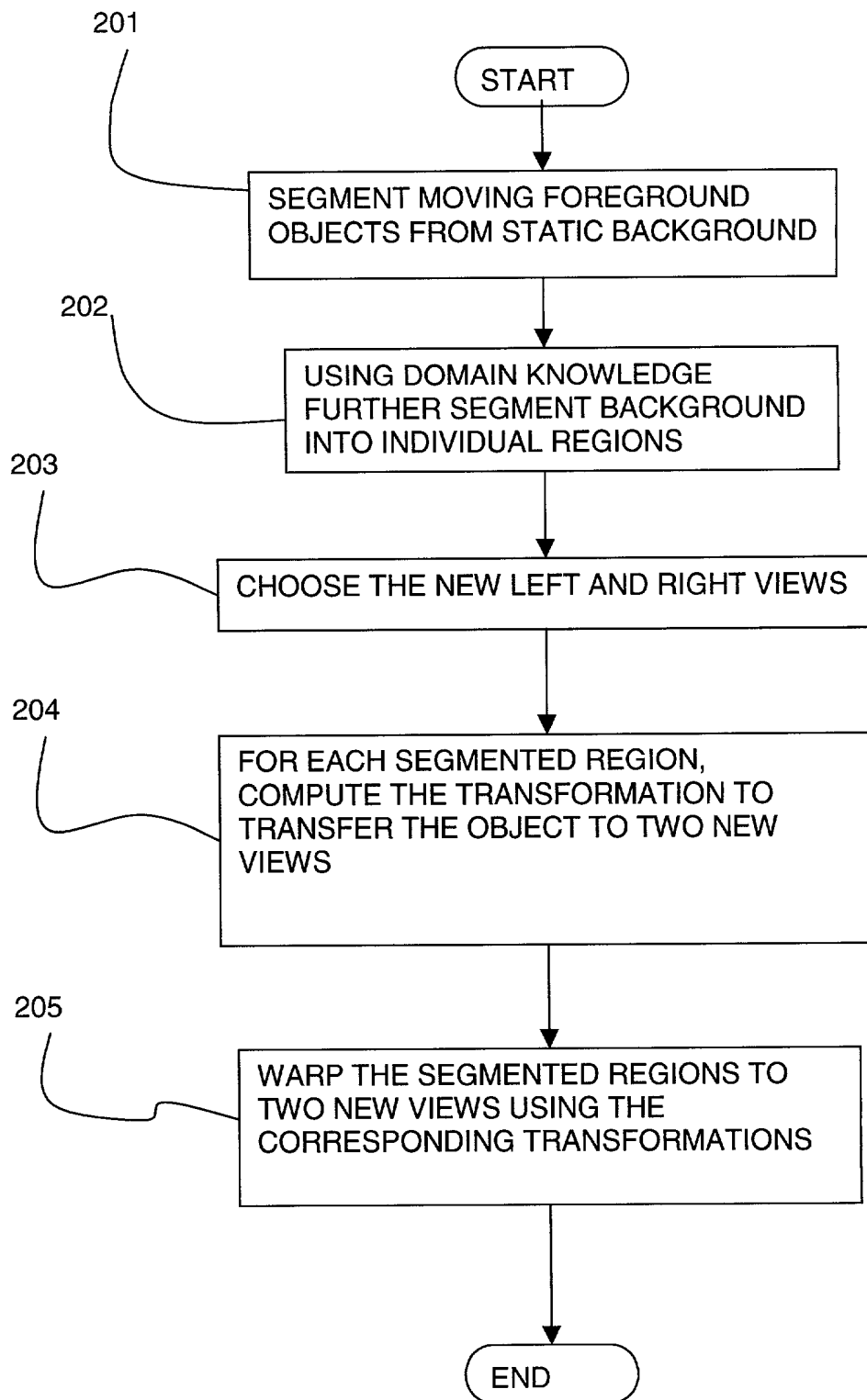


Fig. 2

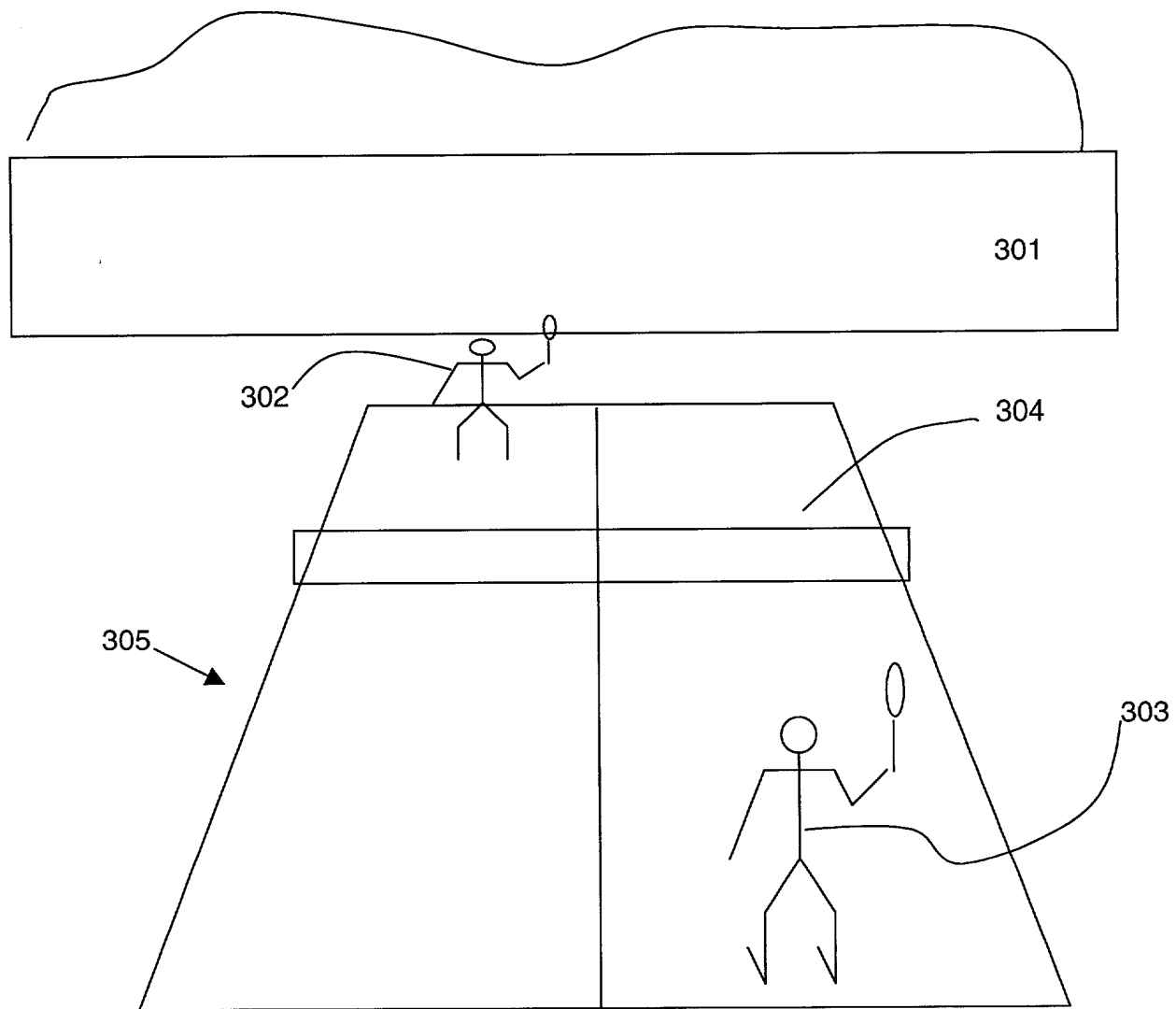


Fig. 3

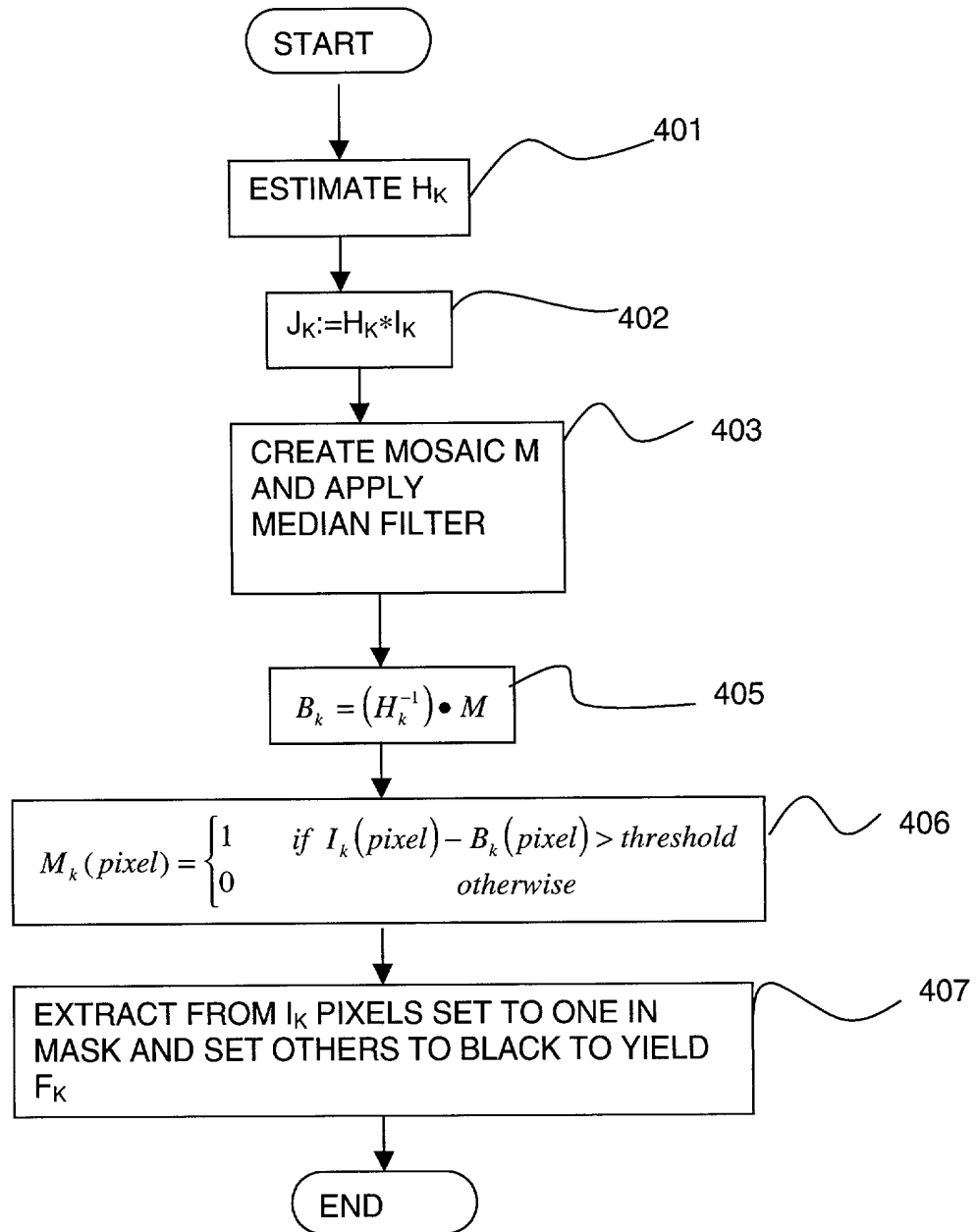


Fig. 4

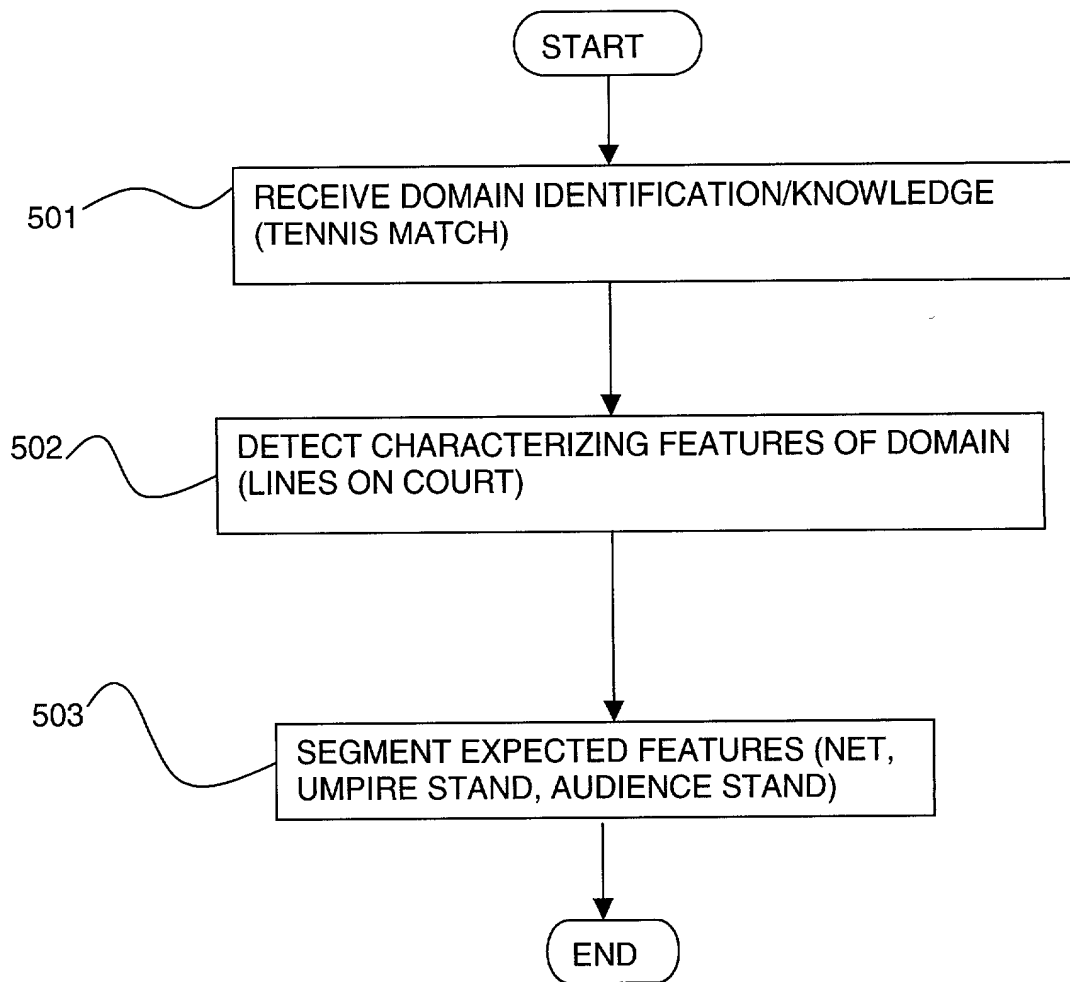


FIG. 5

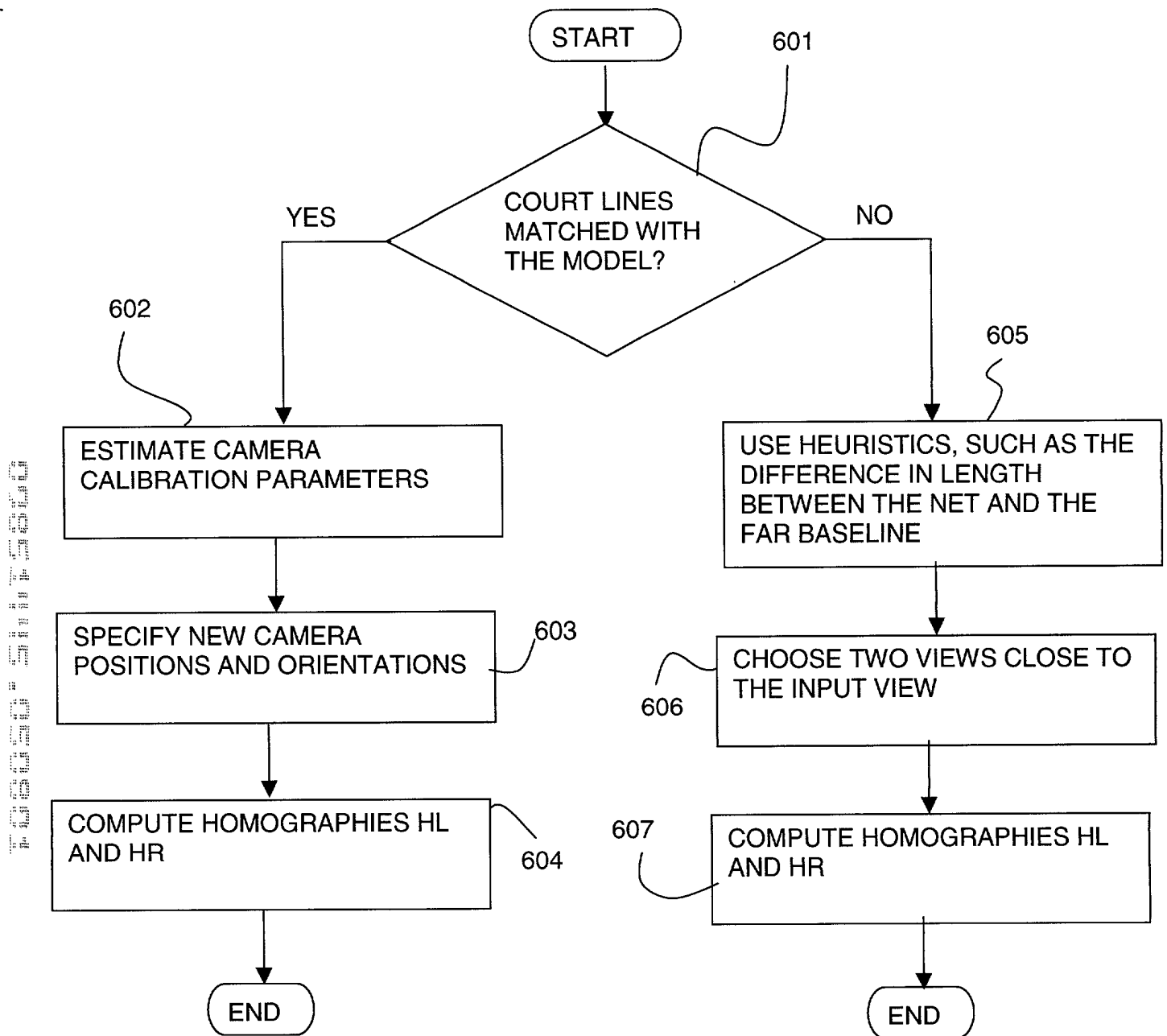


FIG. 6

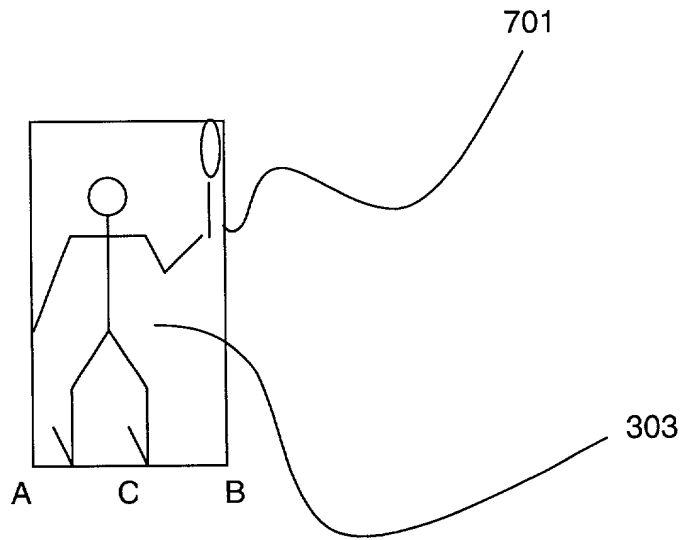


FIG. 7

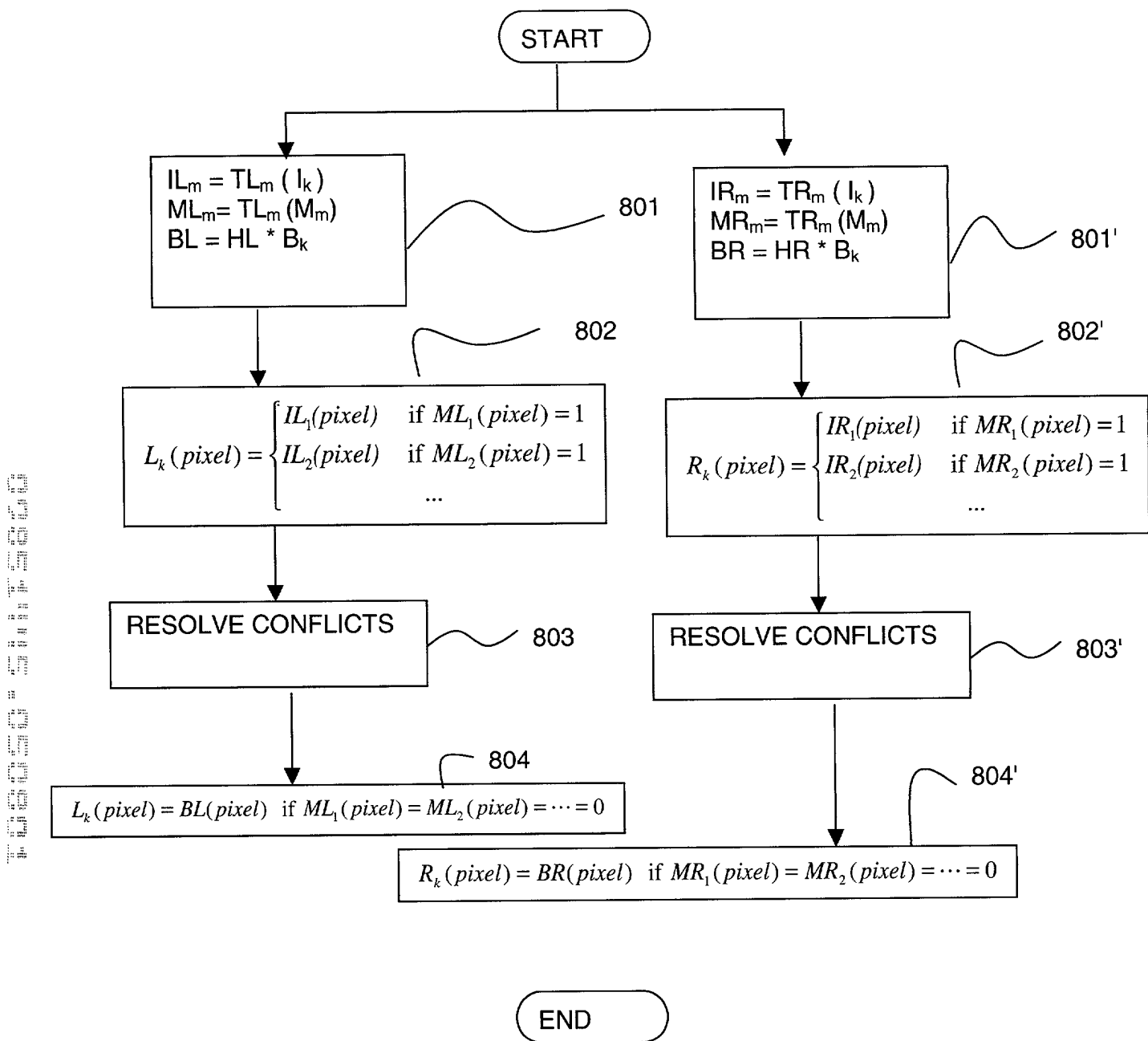


FIG. 8

FIG. 9

$$\left(\frac{h_{11}x + h_{12}y + h_{13}}{h_{31}x + h_{32}y + h_{33}}, \frac{h_{21}x + h_{22}y + h_{23}}{h_{31}x + h_{32}y + h_{33}} \right) \quad (1)$$

$$\mathbf{HL} = \begin{pmatrix} 1 & s_L & d_L \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \quad (2)$$

$$\mathbf{HR} = \begin{pmatrix} 1 & s_R & d_R \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \quad (3)$$

$$(s_L - s_R)y + d_L - d_R \quad (4)$$

$$\mathbf{TL} = \begin{pmatrix} s & 0 & \Delta_x \\ 0 & s & \Delta_y \\ 0 & 0 & 1 \end{pmatrix} \quad (5)$$

$$\mathbf{A} = (\mathbf{A}_x, \mathbf{A}_y) \quad (6)$$

$$\mathbf{B} = (\mathbf{B}_x, \mathbf{B}_y) \quad (7)$$

$$\mathbf{C} = (\mathbf{C}_x, \mathbf{C}_y) \quad (8)$$

$$\mathbf{A}' = (\mathbf{A}'_x, \mathbf{A}'_y) \quad (9)$$

$$\mathbf{B}' = (\mathbf{B}'_x, \mathbf{B}'_y) \quad (10)$$

$$\mathbf{C}' = (\mathbf{C}'_x, \mathbf{C}'_y) \quad (11)$$

FIG. 10

$$s = \frac{|A'x - B'x|}{|Ax - Bx|} \quad \Delta_x = C'x - s \cdot Cx \quad \Delta_y = C'y - s \cdot Cy \quad (12)$$

$$\frac{s_L y_1 + d_L}{s_L y_2 + d_L} = \frac{w_1}{w_2} \quad (13)$$

$$s_L (y_1 w_2 - y_2 w_1) + d_L (w_2 - w_1) = 0 \quad (14)$$

$$s_L y_B + d_L = d_{MAX}$$

$$A'' = (A''x, A''y) \quad (15)$$

$$B'' = (B''x, B''y) \quad (16)$$

$$C'' = (C''x, C''y) \quad (17)$$

$$\mathbf{TR} = \begin{pmatrix} s'' & 0 & \Delta''_x \\ 0 & s'' & \Delta''_y \\ 0 & 0 & 1 \end{pmatrix} \quad (18)$$

FIG. 11

$$s'' = \frac{|A''x - B''x|}{|Ax - Bx|} \quad \Delta''_x = C''x - s''Cx \quad \Delta''_y = C''y - s''Cy \quad (19)$$

$$vp_1 = ([sx_{11} \quad sy_{11} \quad 1] \times [ex_{11} \quad ey_{11} \quad 1]) \times ([sx_{12} \quad sy_{12} \quad 1] \times [ex_{12} \quad ey_{12} \quad 1]) \quad (20)$$

$$vp_2 = ([sx_{21} \quad sy_{21} \quad 1] \times [ex_{21} \quad ey_{21} \quad 1]) \times ([sx_{22} \quad sy_{22} \quad 1] \times [ex_{22} \quad ey_{22} \quad 1]) \quad (21)$$

$$a \times b \quad (22)$$

$$H_a = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ h_1 & h_2 & 1 \end{bmatrix} \quad where \quad \begin{bmatrix} h_1 \\ h_2 \end{bmatrix} = \begin{bmatrix} x_1 & y_1 \\ x_2 & y_2 \end{bmatrix}^{-1} \begin{bmatrix} -w_1 \\ -w_2 \end{bmatrix} \quad (23)$$

$$p_i = [px_i \quad py_i] \quad (24)$$

$$p_i' = \left[\frac{px_i}{h_1 px_i + h_2 py_i + 1} \quad \frac{py_i}{h_1 px_i + h_2 py_i + 1} \right] \quad (25)$$

FIG. 12

$$H_b = \begin{bmatrix} a & b & c \\ d & e & f \\ g & h & 1 \end{bmatrix} \text{ where } \begin{bmatrix} qx_1 & qy_1 & 1 & 0 & 0 & 0 & -px'_1 \cdot qx_1 & -px'_1 \cdot qy_1 \\ qx_2 & qy_2 & 1 & 0 & 0 & 0 & -px'_2 \cdot qx_2 & -px'_2 \cdot qy_2 \\ qx_3 & qy_3 & 1 & 0 & 0 & 0 & -px'_3 \cdot qx_3 & -px'_3 \cdot qy_3 \\ qx_4 & qy_4 & 1 & 0 & 0 & 0 & -px'_4 \cdot qx_4 & -px'_4 \cdot qy_4 \\ \cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot \\ 0 & 0 & 0 & qx_1 & qy_1 & 1 & -py'_1 \cdot qx_1 & -py'_1 \cdot qy_1 \\ 0 & 0 & 0 & qx_2 & qy_2 & 1 & -py'_2 \cdot qx_2 & -py'_2 \cdot qy_2 \\ 0 & 0 & 0 & qx_3 & qy_3 & 1 & -py'_3 \cdot qx_3 & -py'_3 \cdot qy_3 \\ 0 & 0 & 0 & qx_4 & qy_4 & 1 & -py'_4 \cdot qx_4 & -py'_4 \cdot qy_4 \\ \cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot \end{bmatrix} \begin{bmatrix} a \\ b \\ c \\ d \\ e \\ f \\ g \\ h \end{bmatrix} = \begin{bmatrix} -px'_1 \\ -px'_2 \\ -px'_3 \\ -px'_4 \\ \cdot \\ -py'_1 \\ -py'_2 \\ -py'_3 \\ -py'_4 \\ \cdot \end{bmatrix} \quad (26)$$

$$q_i = [qx_i \quad qy_i] \quad (27)$$

$$q_i' = \begin{bmatrix} \frac{a \cdot qx_i + b \cdot qy_i + c}{g \cdot qx_i + h \cdot qy_i + 1} & \frac{e \cdot qx_i + f \cdot qy_i + g}{g \cdot qx_i + h \cdot qy_i + 1} \end{bmatrix} \quad (28)$$

$$e_{12} = ([px'_a \quad py'_a \quad 1] \times [qx'_a \quad qy'_a \quad 1]) \times ([px'_b \quad py'_b \quad 1] \times [qx'_b \quad qy'_b \quad 1]) \quad (29)$$

$$e_{12}' = H_a * \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix} \quad (30)$$

$$e_{22}' = (1 + w) \cdot e_{12} - w \cdot e_{12}' \quad (31)$$

FIG. 13

$$r_i' = ([px_i' \quad py_i' \quad 1] \times e_{12}') \times ([qx_i' \quad qy_i' \quad 1] \times e_{22}') \quad (32)$$

$$r_i = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 1 \\ 0 & 0 & 1 \end{bmatrix} H_a^{-1} \begin{bmatrix} 1 & 0 & d \cdot ex_{12}' \\ 0 & 1 & d \cdot ey_{12}' \\ 0 & 0 & 1+d \end{bmatrix} r_i' \quad (33)$$